



IEEE-MTT Chapter Presentation

Light-matter Interaction in Nanophotonic Devices

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Abstract

Miniaturization and high-density integration of optical devices can enable fast, low-loss, compact nanophotonic systems that operate at reduced power levels. These systems are of great practical interest in areas such as telecommunications, bio-chemical sensing and quantum information processing, for example. At the same time, nano-scale optical devices offer a unique opportunity to study the interaction of light and matter on a nanoscale level. In my talk, I will review design, fabrication and characterization of high quality factor photonic crystal cavities. Recently, we demonstrated ultra-high Q photonic crystal resonators with experimental Q values on the order of one million. These optical nano-resonators, capable of confining photons to ultra-small volumes for long periods of time, are important building blocks of nanophotonic systems. Application of such cavities in nonlinear optics and quantum optics will also be discussed. Finally, I will present our work on novel single-photon sources based on nitrogen-vacancy color centers embedded within top-down fabricated diamond nanowires.

Biography

Marko Lončar received his undergraduate degree at the University of Belgrade (Serbia) and his M.S. and Ph.D. degrees at the California Institute of Technology, all in electrical engineering. Dr. Lončar has co-authored 30 journal articles and has given more than 30 invited talks and seminars. His work on photonic crystal devices was published in a book *Optical Microcavities* (World Scientific, 2004). His past awards include: Outstanding Performer Award (DARPA University Optocenters, 2003); Graduate Student Silver Award (Material Research Society, 2002); C. Powel Fellowship (California Institute of Technology, 1997-1998); Valedictorian Faculty of Electrical Engineering (University of Belgrade, 1997); and a Fellowship from the Foundation for Development of Science and Art (Ministry of Science and Technology, Republic of Serbia, 1990-1997).

Date: Thursday May 7th, 2009

Time: 3:30 pm

Location: EIT 1015

Invited by: Prof. Sujeet Chaudhuri